

## A MAGNETIC TUNNEL JUNCTION SENSOR WITH NON-SHUNTING STABILIZATION

### ABSTRACT OF THE DISCLOSURE

5           A magnetic tunnel junction (MTJ) sensor in which the free layer longitudinal  
biasing elements are coupled, without insulation, to the free layer outside of the MTJ  
stack to provide reliable non-shunting MTJ free layer stabilization without extremely thin  
dielectric layers. In one embodiment, hard magnetic (HM) layers are disposed in contact  
with the free layer outside of and separated from the MTJ stack active region by a thick  
10   dielectric layer. In another embodiment, antiferromagnetic (AFM) bias layers are  
disposed in contact with the free layer outside of and separated from the MTJ stack active  
region by a thick dielectric layer. In other embodiments, nonconductive HM layers are  
disposed either in contact with the free layer outside of the MTJ stack active region  
and/or in abutting contact with the MTJ stack active region.

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